

Fig. 2 is a perspective view of a base shown in Fig. 1(A) on which a coating material is applied.

Fig. 3 is a perspective view of a base shown in Fig. 1(A) on which electroless plating is applied.

Fig. 4 is a perspective view of a comparative base.

Fig. 5 is a perspective view of a comparative base shown in Fig. 4, on which a coating material is applied.

Fig. 6 is a perspective view of an assembly of bases according to another example of the present invention.

Figs. 7(A)-7(C) show an assembly of Fig. 6 on which a coating material is applied, wherein Figs. 7(A), 7(B) and 7(C) are a perspective view, a sectional illustration taken on line 7(B)-7(B) in Fig. 7(A) and a partially cutaway view of Fig. 7(B), respectively.

Fig. 8 is a partially sectional view of a covered assembly on which plating is applied.

Fig. 9 is a perspective view of a chip part produced by cutting a plated assembly shown in Fig. 8.

Delete page 5, lines 5-9, and add, as follows:

When such polymers are biodegradable in nature, the coating material will be easily degraded to water and carbon dioxide owing to soil or aquatic microorganisms. Consequently, a waste treatment of such polymers after their removal from a base can be done simply without causing environmental problems.

Delete page 5, lines 18-28, and add, as follows:

Further, as the water soluble or hydrolyzable polymer is finally removed from the plated products, a coating configuration thereof is not influenced by shapes or sizes of final products and can be designed exclusively for convenience of plating to contribute to downsizing of the products. As the shapes or sizes of final products are not restricted by configurations or dimensions of the coating material during the plating process, it is possible to coat the base quite freely so that circuit electrode of three-dimensional patterns is formed on the base. This increases the degree of freedom of designing chip parts such as

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circuit electrode and, in addition, various kinds of electronic and electric parts integrated with the base, while downsizing of these parts is promoted.

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Delete page 9, line 31 to page 10, line 2, and add, as follows:

On the other hand, in wet type etching, the base is coated with or soaked in an aqueous alkali metal hydroxide such as NaOH and KOH; an aqueous solution of metal alcoholate such as alcoholic sodium and alcoholic potassium; or an organic solvent such as dimethyl-folmamide to contact the base surface with such a liquid etchant.

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Delete page 12, lines ~~20-30~~, and add, as follows:

When the coating material of water soluble or hydrolyzable polymer is as thin as about 100 to 1,000 μm and preferably about 10 to 500 μm in thickness, application of the plating catalyst and removal of the coating material may be done at the same time, because complete elution of the coating material may occur during the plating catalyst applying process which comprises a series of processes including adhesion of plating catalyst such as the above mentioned complex Sn^{2+} - Pd^{2+} , water washing in which $\text{Sn}(\text{OH})\text{Cl}$ is precipitated due to hydrolyzation of the complex, and the accelerator treatment in which $\text{Sn}(\text{OH})\text{Cl}$ is dissolved and reacted through an oxidation-reduction reaction with Pd^{2+} freed from its complexing situation during water washing.

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Delete page 12, line 34 to page 13, line 8, and add, as follows:

Further, when the coating material is formed by injection molding in which the base is used as a part of the mold after the base surface is roughed, unevenness of the base (roughed surface) is liable to disappear due to intimate contact thereof with an injection mold. For that reason, the base is arranged in the mold to leave a slight space between the base and the mold so that the coating material is applied to the space to form fins, although such a space is an area not to be coated essentially. The coating

Ch 17
material applied to the slight space, i.e. fins, can be eluted completely during the catalyst applying process because of considerably thin thickness thereof.

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Delete page 14, line 4.

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Delete page 14, lines 24-26, and add, as follows:

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Outer dimensions of the base 1 are 50 x 30 x 5 mm, while two through holes 2 are formed on the upper surface in the diagonal direction as shown in Figs. 1(A) and 1(B).

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Delete page 17, lines 17-25, and add, as follows:

18
A plating bath was prepared by mixing the same plating catalyst used in Example 1 ("ENILEX CT-8"®, available from EBARA-UDYLITE Co., Ltd.) in a ratio of 20 ml/l with 150 ml/l-concentrated sulfuric acid and was kept at 30°C. Similarly as described in Example 1, primarily molded and surface-roughed articles 11 were soaked in the thus prepared bath for 3 minutes, washed with water, which were then soaked in an accelerator solution containing sulfuric acid of 80 ml/l-concentration at 50°C for 4 minutes and washed with water to apply the plating catalyst throughout the surface of these bases.

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Delete page 18, line 23 to page 19, line 1, and add, as follows:

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A plating bath was prepared by adding the same plating catalyst used in Example 1 ("ENILEX CT-8"®, available from EBARA-UDYLITE Co., Ltd.) in an ratio of 20 ml/l to water, followed by addition of HCl in a ratio of 150 ml/l thereto and was kept at 30°C. Similarly as described in Example 1, the molded and partially covered articles 1 were soaked in the thus prepared bath for 4 minutes (generally for 3 to 5 minutes), washed with water, which were then soaked in a 8-% hydrochloric acid solution (generally 5 to 10 % solution) at 30°C for 4 minutes as an accelerator treatment to apply the plating catalyst to the molded article except the surface partially covered with the covering material 3.

Delete page 23, lines 1-3, and add, as follows:

Outer dimensions of the base assembly 21 are $a = 40$ mm, $b = 5$ mm, $c = 4$ mm, $d = 7$ mm and $e = 7$ mm, respectively, while a plurality of through holes 2 are formed along straight lines on the upper surface.

Delete page 23, line 28 to page 24, line 15, and add, as follows:

The surface-roughed base 1 was set in a secondary mold kept at 10°C, while a hydrolyzable polymer (a polylactate resin LACEA®, available from Mitsui Chemical Co., Ltd.) as a coating material 3 was heated to 190°C and injected into the secondary mold at an injection pressure of 350 kg/cm² (generally 200 to 1200 kg/cm²) to form molded articles partially coated by the coating material 3 as shown in Figs. 7(A)-7(C), in which Fig. 7(A) is a perspective view on the whole, Fig. 7(B) is a sectional illustration taken along line 7(B)-7(B) in Fig. 7(A) and Fig. 7(C) is a partially cutaway view of Fig. 7(B), respectively.

The coating material 3 on these molded articles were 1 mm and 0.5 mm in thickness, respectively.

[Plating catalyst applying process and coating material removing process]

A plating bath was prepared by adding a mixed hydrochloric acid solution with stannous chloride and palladium chloride as a plating catalyst salt ("ENILEX CT-8"®, available from EBARA-UDYLITE Co., Ltd.) to methyl alcohol in a ratio of 20 ml/l, and kept at 30°C. A plurality of molded articles, which were partially coated as described above, were put in the barrel-like container, soaked in the thus prepared plating bath for 4 minutes while rotating, washed with water and soaked in a solution containing hydrochloric acid in a ratio of 50 ml/l at 60° for 60 minutes as an accelerator treatment to apply the plating catalyst on the molded article except the partially coated surface and, at the same time to conduct a process for eluting and removing the coating material 3.

Delete page 25, lines 1-6, and add, as follows:

012
Fig. 8 illustrates plated portions on the base surface obtained by this example. Numeral 4 designates Cu-plated, or further after-Ni- or Au-plated portions on which the plating catalyst has been applied. It was observed that these portions 4 were located only on the surface except an area coated with the coating material 3 as shown in Figs. 7(A) to 7(C) and an inner surface of through hole 2.

Delete page 25, line 26 to page 26, line 21, and add, as follows:

013
The base assembly 21 used in Example 7 was partially coated with coating material 3 as shown in Figs. 7(A) to 7(C) and subjected to a plating process similarly as described in Example 3 using the compositions of preliminary and main plating bath under the plating conditions as shown in Tables 3 and 4 in Example 7, respectively, which was then cut off in a similar manner as described in Example 7 to form chip parts having a shape of Fig. 9 (perspective view).

Example 9

The base assembly 21 used in Example 7 was partially coated with coating material 3 as shown in Figs. 7(A) to 7(C) and subjected to a plating process similarly as described in Example 4 using the compositions of preliminary and main plating bath under the plating conditions as shown in Tables 3 and 4 in Example 7, respectively, which was then cut off in a similar manner as described in Example 7 to form chip parts having a shape of Fig. 9 (perspective view).

Example 10

The base assembly 21 used in Example 7 was partially coated with coating material 3 as shown in Figs. 7(A) to 7(C) and subjected to a plating process similarly as described in Example 5 using the compositions of preliminary and main plating bath under the plating conditions as shown in Tables 3 and 4 in Example 7,